

thing but a good Artist to bring the design to Perfection. For the Glas being wrought by one of our *London* Artists after such a manner as they grind Glasses for Telescopes, tho it seemed as well wrought as the Object Glasses use to be, yet when it was quick-silvered, the reflexion discovered innumerable Inequalities all over the Glas. And by reason of these Inequalities, Objects appeared indistinct in this Instrument. For the Errors of reflected Rays caused by any Inequality of the Glas, are about six times greater than the Errors of refracted Rays caused by the like Inequalities. Yet by this Experiment I satisfied my self that the reflexion on the concave side of the Glas, which I feared would disturb the vision, did no sensible prejudice to it, and by consequence that nothing is wanting to perfect these Telescopes, but good Workmen who can grind and polish Glasses truly spherical. An Object-Glas of a fourteen Foot Telescope, made by one of our *London* Artificers, I once mended considerably, by grinding it on Pitch with Putty, and leaning very easily on it in the grinding, lest the Putty should scratch it. Whether this way may not do well enough for polishing these reflecting Glasses, I have not yet tried. But he that shall try either this or any other way of polishing which he may think better, may do well to make his Glasses ready for polishing by grinding them without that violence, wherewith our *London* Workmen press their Glasses in grinding. For by such violent pressure, Glasses are apt to bend a little in the grinding, and such bending will certainly spoil their Figure. To recommend therefore the consideration of these reflecting Glasses, to such Artists as are curious in figuring Glasses, I shall describe this Optical Instrument in the following Proposition.

PROP.

PROP. VII. Prob. II.

To shorten Telescopes.

LET ABDC represent a Glas spherically concave on the foreside AB, and as much convex on the backside CD, so that it be every where of an equal thickness. Let it not be thicker on one side than on the other, lest it make Objects appear coloured and indistinct, and let it be very truly wrought and quick-silvered over on the backside; and set in the Tube VXYZ which must be very black within. Let EFG represent a Prism of Glas or Crystal placed near the other end of the Tube, in the middle of it, by means of a handle of Brass or Iron FGK, to the end of which made flat it is cemented. Let this Prism be rectangular at E, and let the other two Angles at F and G be accurately equal to each other, and by consequence equal to half right ones, and let the plane sides FE and GE be square, and by consequence the third side FG a rectangular parallelogram, whose length is to its breadth in a subduplicate proportion of two to one. Let it be so placed in the Tube, that the Axis of the Speculum may pass through the middle of the square side EF perpendicularly, and by consequence through the middle of the side FG at an Angle of 45 degrees, and let the side EF be turned towards the Speculum, and the distance of this Prism from the Speculum be such that the Rays of the light PQ, RS, &c. which are incident upon the Speculum in Lines Parallel to the Axis thereof, may enter the Prism at the side EF, and be reflected by the side FG, and thence go out of it through the side GE, to the point T which must be the common Focus of the Speculum ABDC, and of a Plano-convex Eye-Glas H, through which those Rays must pass to the Eye. And let the Rays at their coming out.